IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Canceled)

2. (Canceled)

3. (Currently Amended) A method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths; and

the receiver receiving the signal;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path;

wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths;

wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements;

wherein the transmitter forms weighting coefficients using the weighting coefficient data signaling; ~~A method according to claim 2,~~

wherein the transmitter forms a quality value for the weighting coefficient data signaling ~~signalling~~ it has received; and

wherein the transmitter forms weighting coefficients using ~~by means of~~ the quality value of the weighting coefficient data signaling ~~signalling~~ and the signaling ~~signalling~~ itself.

4. (Currently Amended) The [[A]] method of ~~according to~~ claim [[2]] 3, wherein the values of the weighting coefficients are predetermined, and the predetermined values of the weighting coefficients are divided into different groups, each of which has a particular weighting coefficient for each transmit antenna path, the weighting coefficient data signaling

~~signalling~~ comprising information about which group of weighting coefficients the receiver wants to be used.

5. (Currently Amended) The [[A]] method of ~~according to~~ claim [[2]] 3, wherein the weighting coefficient data comprises information about the transmit antenna path via which the signal with the best quality value was transmitted.

6. (Currently Amended) The [[A]] method of ~~according to~~ claim [[2]] 3, wherein the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially.

7. (Currently Amended) The [[A]] method of ~~according to~~ claim [[2]] 3, wherein the weighting coefficient data comprises at least one channel parameter measured by the receiver.

8. (Currently Amended) ~~A method according to claim 2~~, A method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths; and

the receiver receiving the signal;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path;

wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths;

wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements;

wherein the transmitter forms weighting coefficients using the weighting coefficient data signaling; and

wherein the transmit antenna paths are connected to at least two different base stations of a network part in the radio system.

9. (Currently Amended) The [[A]] method of ~~according to~~ claim [[1]] 3, wherein the weighting coefficients used in the transmission are ~~signalled~~ signaled to the receiver.

10. (Currently Amended) The [[A]] method of ~~according to~~ claim 9, wherein the weighting coefficients are ~~signalled~~ signaled to the receiver ~~by means of~~ using an identification sequence which is inserted in the transmitted signal and which varies depending on the weighting of the signal.

11. (Currently Amended) The [[A]] method of ~~according to~~ claim 9, wherein the weighting coefficients are ~~signalled~~ signaled to the receiver ~~by means of~~ using modulation, spreading or coding of the signal specifically for each transmit antenna path.

12. (Currently Amended) The [[A]] method of ~~according to~~ claim 4, wherein identification data for the group of weighting coefficients used in the transmission is ~~signalled~~ signaled to the receiver ~~by means of~~ using identification bits inserted in the transmitted signal.

13. (Currently Amended) A method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths; and

the receiver receiving the signal;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path;

wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths;

wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements;

wherein the transmitter forms weighting coefficients using the weighting coefficient data signaling;

wherein the transmitter forms a quality value for the weighting coefficient data signaling it has received;

wherein the transmitter forms weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself; and

~~A method according to claim 3,~~ wherein, when the quality value for signaling ~~signalling~~ falls below a predetermined threshold value, the weighting coefficients are not changed.

14. (Currently Amended) A method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths; and

the receiver receiving the signal;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path;

wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths;

wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements;

wherein the transmitter forms weighting coefficients using the weighting coefficient data signaling;

wherein the transmitter forms a quality value for the weighting coefficient data signaling it has received;

wherein the transmitter forms weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself; and

~~A method according to claim 3,~~ wherein, when the quality value for signaling ~~signalling~~ falls below a predetermined threshold value, the weighting coefficients are set to an equal value over each transmit antenna path.

15. (Currently Amended) A method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths; and

the receiver receiving the signal;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path;

wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths;

wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements;

wherein the transmitter forms weighting coefficients using the weighting coefficient data signaling;

wherein the transmitter forms a quality value for the weighting coefficient data signaling it has received;

wherein the transmitter forms weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself; and

~~A method according to claim 3,~~ wherein, when the quality value for signaling ~~signalling~~ exceeds a predetermined threshold value, the weighting coefficients are changed.

16. (Currently Amended) The [[A]] method of ~~according to~~ claim [[1]] 3, wherein signals to be transmitted via two different transmit antenna paths are as mutually orthogonal as possible.

17. (Currently Amended) The [[A]] method of ~~according to~~ claim 16, wherein the orthogonality is implemented by using a different spreading or channel code for each transmit antenna path.

18. (Currently Amended) The [[A]] method of ~~according to~~ claim 16, wherein the orthogonality is implemented by using a different transmission frequency for each transmit antenna path.

19. (Currently Amended) The [[A]] method of ~~according to~~ claim 16, wherein the orthogonality is implemented by using a different slot for each transmit antenna path.

20. (Currently Amended) The [[A]] method of ~~according to~~ claim [[1]] 3, wherein the signal is coded in order to minimize transmission errors in the transmission channel.

21. (Currently Amended) The [[A]] method of ~~according to~~ claim 20, wherein the coding is space-time coding.

22. (Currently Amended) The [[A]] method of ~~according to~~ claim 21, wherein the space-time coding is space-time block coding.

23. (Currently Amended) The [[A]] method of ~~according to~~ claim 21, wherein the space-time coding is space-time trellis coding.

24. (Currently Amended) The [[A]] method of ~~according to~~ claim [[1]] 3, wherein the transmit antenna paths are connected to one base station of the network part in the radio system.

25. (Currently Amended) The [[A]] method of ~~according to~~ claim [[1]] 3, wherein the transmitter is situated in a radio network subsystem of the radio system network part, and the receiver is situated in a user equipment of the radio system.

26. (Currently Amended) The [[A]] method of ~~according to~~ claim [[1]] 3, wherein a user equipment of the radio system determines the weighting coefficients used by the network part of the radio system in transmitting to the user equipment in question.

27. (Currently Amended) The [[A]] method of ~~according to~~ claim [[1]] 3, wherein the network part of the radio system determines itself the weighting coefficients it uses in transmission.

28. (Currently Amended) The [[A]] method of ~~according to~~ claim 27, wherein the network part of the radio system takes into account the loading of each power amplifier over the transmit antenna path when it makes the decision.

29. (Currently Amended) The [[A]] method of ~~according to~~ claim [[1]] 3, wherein a transmit antenna path is implemented ~~by means of~~ using an antenna structure that provides phasing.

30. (Currently Amended) The [[A]] method of ~~according to~~ claim 29, wherein the phasing is determined ~~by means of~~ using channel parameters ~~signalled~~ signaled by the receiver.

31. (Currently Amended) The [[A]] method of ~~according to~~ claim 29, wherein the phasing of transmission is determined ~~by means of~~ using signals that have arrived at the same antenna elements.

32. (Currently Amended) A method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths; and

the receiver receiving the signal;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path,

wherein a transmit antenna path is implemented using an antenna structure that provides phasing; and

~~A method according to claim 29,~~ wherein transmissions are sent from at least one antenna element with at least two different phases or antenna beams, such that signals to be transmitted with different phases have different pilot sequences, identification sequences, structures or different coding, ~~preferably different parts of a space-time code, by means of which~~

~~- beam channel parameters are estimated,~~

~~- beam signals are combined,~~

~~- weighting coefficient information~~ data ~~for the beams is calculated and signalled to the transmitter~~.

33. (Canceled)

34. (Canceled)

35. (Currently Amended) A radio system for transmitting a digital signal, the radio system comprising:

a transmitter for transmitting a signal;

at least two transmit antenna paths that can be connected to the transmitter;

a receiver for receiving the signal;

wherein the transmitter comprises

changing means for changing the weighting coefficients determined for each transmit antenna path with respect to one another, and

weighting means for weighting the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another,

wherein the receiver comprises means for performing measurements on the received signals that were transmitted via the different transmit antenna paths, and means for signaling to the transmitter the weighting coefficient data formed on the basis of the measurements; and

the transmitter further comprises means for receiving the weighting coefficient data signaling, and wherein the changing means form weighting coefficients using the weighting coefficient data signaling, and ~~A radio system according to claim 34~~,

wherein the transmitter comprises means for forming a quality value for the weighting coefficient data signaling ~~signalling~~ it has received, and the changing means form weighting coefficients ~~by means of~~ using the quality value of the weighting coefficient data signaling ~~signalling~~ and the signaling ~~signalling~~ itself.

36. (Currently Amended) The [[A]] radio system of ~~according to~~ claim [[34]] 35, wherein the values of the weighting coefficients are predetermined, and the predetermined values of the weighting coefficients are divided into different groups, each of which has a particular weighting coefficient determined for each transmit antenna path, the weighting coefficient data signaling ~~signalling~~ comprising information about which group of weighting coefficients the receiver wants to be used.

37. (Currently Amended) The [[A]] radio system of ~~according to~~ claim [[34]] 35, wherein the weighting coefficient data comprises information about the transmit antenna path via which the signal with the best quality value was transmitted.

38. (Currently Amended) The [[A]] radio system of ~~according to~~ claim [[34]] 35, wherein the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially.

39. (Currently Amended) The [[A]] radio system of ~~according to~~ claim [[34]] 35, wherein the weighting coefficient data comprises at least one channel parameter measured by the receiver.

40. (Currently Amended) A radio system for transmitting a digital signal, comprising:

a transmitter for transmitting a signal;

at least two transmit antenna paths that can be connected to the transmitter;

a receiver for receiving the signal;

wherein the transmitter comprises:

changing means for changing the weighting coefficients determined for each transmit antenna path with respect to one another, and

weighting means for weighting the transmit power of the signals to be transmitted via different transmit antenna paths using coefficients that can be changed with respect to one another;

wherein the receiver comprises means for performing measurements on the received signals that were transmitted via the different transmit antenna paths, and means for signaling to the transmitter the weighting coefficient data formed on the basis of the measurements;

wherein the transmitter further comprises means for receiving the weighting coefficient data signaling, and the changing means form weighting coefficients using the weighting coefficient data signaling; and

~~A radio system according to claim 34,~~ wherein the transmit antenna paths are connected to at least two different base stations of a network part in the radio system.

41. (Currently Amended) The [[A]] radio system of ~~according to~~ claim [[34]] 35, wherein the transmitter comprises means for signaling ~~signalling~~ the weighting coefficients used in the transmission to the receiver ~~by means of~~ using pilot bits inserted in the transmitted signal.

42. (Currently Amended) The [[A]] radio system of ~~according to~~ claim 36, wherein the transmitter comprises means for signaling ~~signalling~~ to the receiver identification data for the group of weighting coefficients used in the transmission ~~by means of~~ using pilot bits inserted in the transmitted signal.

43. (Currently Amended) A radio system for transmitting a digital signal, comprising:

a transmitter for transmitting a signal;

at least two transmit antenna paths that can be connected to the transmitter;

a receiver for receiving the signal;

wherein the transmitter comprises:

changing means for changing the weighting coefficients determined for each transmit antenna path with respect to one another; and

weighting means for weighting the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another,

wherein the receiver comprises:

means for performing measurements on the received signals that were transmitted via the different transmit antenna paths; and

means for signaling to the transmitter the weighting coefficient data formed on the basis of the measurements;

wherein the transmitter further comprises:

means for receiving the weighting coefficient data signaling, wherein the changing means form weighting coefficients using the weighting coefficient data signaling;

means for forming a quality value for the weighting coefficient data signaling it has received, wherein the changing means form weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself; and

~~A radio system according to claim 35,~~ wherein, when the quality value for signaling ~~signalling~~ falls below a predetermined threshold value, the changing means do not change the weighting coefficients.

44. (Currently Amended) A radio system for transmitting a digital signal, comprising:

a transmitter for transmitting a signal;

at least two transmit antenna paths that can be connected to the transmitter;

a receiver for receiving the signal;

wherein the transmitter comprises:

changing means for changing the weighting coefficients determined for each transmit antenna path with respect to one another; and

weighting means for weighting the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another,

wherein the receiver comprises:

means for performing measurements on the received signals that were transmitted via the different transmit antenna paths; and

means for signaling to the transmitter the weighting coefficient data formed on the basis of the measurements;

wherein the transmitter further comprises:

means for receiving the weighting coefficient data signaling, wherein the changing means form weighting coefficients using the weighting coefficient data signaling;

means for forming a quality value for the weighting coefficient data signaling it has received, wherein the changing means form weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself; and

~~A radio system according to claim 35,~~ wherein, when the quality value for signaling ~~signalling~~ falls below a predetermined threshold value, the changing means set the weighting coefficients to an equal value over each transmit antenna path.

45. (Currently Amended) A radio system for transmitting a digital signal, comprising:

a transmitter for transmitting a signal;

at least two transmit antenna paths that can be connected to the transmitter;

a receiver for receiving the signal;

wherein the transmitter comprises:

changing means for changing the weighting coefficients determined for each transmit antenna path with respect to one another; and

weighting means for weighting the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another,

wherein the receiver comprises:

means for performing measurements on the received signals that were transmitted via the different transmit antenna paths; and

means for signaling to the transmitter the weighting coefficient data formed on the basis of the measurements;

wherein the transmitter further comprises:

means for receiving the weighting coefficient data signaling, wherein the changing means form weighting coefficients using the weighting coefficient data signaling;

means for forming a quality value for the weighting coefficient data signaling it has received, wherein the changing means form weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself; and

~~A radio system according to claim 35,~~ wherein, when the quality value for signaling ~~signalling~~ exceeds a predetermined threshold value, the changing means change the weighting coefficients.

46. (Currently Amended) The [[A]] radio system of ~~according to~~ claim [[33]] 35, wherein signals to be transmitted via two different transmit antenna paths are as mutually orthogonal as possible.

47. (Currently Amended) The [[A]] radio system of ~~according to~~ claim [[33]] 35, wherein the transmitter comprises means for coding the signal in order to minimize transmission errors in the transmission channel.

48. (Currently Amended) The [[A]] radio system of ~~according to~~ claim 47, wherein the coding is space-time coding.

49. (Currently Amended) The [[A]] radio system of ~~according to~~ claim 48, wherein the space-time coding is space-time block coding.

50. (Currently Amended) The [[A]] radio system of ~~according to~~ claim 48, wherein the space-time coding is space-time trellis coding.

51. (Currently Amended) The [[A]] radio system of ~~according to~~ claim [[33]] 35, wherein the transmit antenna paths are connected to one base station of the network part of the radio system.

52. (Currently Amended) The [[A]] radio system of ~~according to~~ claim [[33]] 35, wherein the transmitter is situated in a radio network subsystem ~~(RNS)~~ of the radio system network part, and the receiver is situated in a user equipment ~~(UE)~~ of the radio system.

53. (Currently Amended) The [[A]] radio system of ~~according to~~ claim [[33]] 35, wherein the user equipment ~~(UE)~~ of the radio system comprises means for determining the weighting coefficients used by the network part of the radio system in transmitting to the user equipment ~~(UE)~~ in question.

54. (Currently Amended) The [[A]] radio system of ~~according to~~ claim [[33]] 35, wherein the network part of the radio system comprises decision-making means for determining the weighting coefficients it uses in transmission.

55. (Currently Amended) The [[A]] radio system of ~~according to~~ claim 54, wherein the decision-making means utilize data about the loading of a power amplifier of each transmit antenna path when they make a decision.

56. (Currently Amended) The [[A]] radio system of ~~according to~~ claim [[33]] 35, wherein a transmit antenna path is implemented ~~by means of~~ using an antenna structure that provides phasing.

57. (New) A radio system for transmitting a digital signal, the system comprising:

a transmitter for transmitting at least a part of the signal via at least two different transmit antenna paths; and

a receiver for receiving the signal;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path,

wherein a transmit antenna path is implemented using an antenna structure that provides phasing; and

wherein transmissions are sent from at least one antenna element with at least two different phases or antenna beams.

58. (New) The system of claim 57, wherein:

the signals to be transmitted with different phases have at least one differing characteristic including different pilot sequences, identification sequences, structures or different coding;

the receiver estimates beam channel parameters using that at least one differing characteristic,

the receiver combines the beam signals using that at least one differing characteristic,

the receiver calculates the weighting coefficient data for the beams using that at least one differing characteristic; and

the receiver signals the calculated weighting coefficient data to the transmitter.

59. (New) A method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths; and

the receiver receiving the signal;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path;

wherein transmit antenna paths form at least two different antenna beams, such that signals to be transmitted with different antenna beams have different parts of a space-time code, and wherein the different parts of the space-time code are weighted differently.

60. (New) The method of claim 59, wherein different antenna beams have different pilot sequences, and the method further comprises:

estimating antenna beam channel parameters using the pilot sequences;

combining the antenna beam signals using the pilot sequences; and

calculating weighting coefficient data for the antenna beams using the pilot sequences; and

signaling the calculated weighting coefficient data to the transmitter.

61. (New) The method of claim 60, wherein weighting coefficients for the antenna beams are formed at the transmitter.

62. (New) The method of claim 59, wherein the receiver sends weighting coefficient data to the transmitter, and the transmitter forms the weighting coefficients for the antenna beams using the weighting coefficient data.

63. (New) The method of claim 59, wherein the antenna beams are adaptive and controlled with at least one of uplink signaling and measurements.

64. (New) A radio system for transmitting a digital signal, the system comprising:

a transmitter configured to transmit at least a part of the signal via at least two different transmit antenna paths; and

a receiver configured to receive the signal;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using a changeable weighting coefficients determined for each transmit antenna path;

wherein transmissions are sent from at least one antenna element with at least two different phases or antenna beams, such that signals to be transmitted with different phases have different pilot sequences, identification sequences, structures or different coding, and wherein the different parts of the space-time code are weighted differently.

65. (New) The system of claim 64, wherein:

different antenna beams have different pilot sequences,

antenna beam channel parameters are estimated in the receiver using the different pilot sequences,

antenna beam signals are combined in the receiver using the different pilot sequences; and

weighting coefficient data for the antenna beams is calculated using the different pilot sequences and signaled to the transmitter.

66. (New) The system of claim 64, wherein weighting coefficients for the antenna beams are formed at the transmitter.

67. (New) The system of claim 64, wherein the receiver signals to the transmitter weighting coefficient data, and the transmitter forms the weighting coefficients for the antenna beams using the signaled weighting coefficient data.

68. (New) The system of claim 64, wherein the antenna beams are adaptive and controlled with at least one of uplink signaling and measurements.

69. (New) A method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths; and

the receiver receiving the signal;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path;

wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths;

wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements;

wherein the transmitter forms weighting coefficients using the weighting coefficient data signaling; and

wherein the transmit antenna paths are connected to at least two different transmission sectors of a base station in the radio system.

70. (New) The method of claim 69, wherein, the signals to be transmitted with different phases have at least one differing characteristic including different pilot sequences, identification sequences, structures or different coding and the method further comprises:

estimating beam channel parameters using that at least one differing characteristic,

combining the beam signals using that at least one differing characteristic,

calculating the receiver the weighting coefficient data for the beams using that at least one differing characteristic; and

signaling the calculated weighting coefficient data to the transmitter.

71. (New) A radio system for transmitting a digital signal, comprising:

a transmitter configured to transmit a signal;

at least two transmit antenna paths that can be connected to the transmitter;

a receiver configured to receive the signal;

wherein the transmitter is configured to change the weighting coefficients determined for each transmit antenna path with respect to one another, and configured to weight the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another.

72. (New) The radio system of claim 71, wherein the receiver is configured to perform measurements on the received signals that were transmitted via the different transmit antenna paths, and configured to signal to the transmitter the weighting coefficient data formed on the basis of the measurements and wherein the transmitter is configured to receive the weighting coefficient data signaling, and form weighting coefficients using weighting coefficient data signaling.

73. (New) The radio system of claim 72, wherein the transmitter is configured to form a quality value for the weighting coefficient data signaling it has received, and configured to form weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself.

74. (New) The radio system of claim 72, wherein the values of the weighting coefficients are predetermined, and the predetermined values of the weighting coefficients are divided into different groups, each of which has a particular weighting coefficient determined

for each transmit antenna path, the weighting coefficient data signaling comprising information about which group of weighting coefficients the receiver wants to be used.

75. (New) The radio system of claim 72, wherein the weighting coefficient data comprises information about the transmit antenna path via which the signal with the best quality value was transmitted.

76. (New) The radio system of claim 72, wherein the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially.

77. (New) The radio system of claim 72, wherein the weighting coefficient data comprises at least one channel parameter measured by the receiver.

78. (New) A radio system for transmitting a digital signal, comprising:

a transmitter configured to transmit a signal;

at least two transmit antenna paths that can be connected to the transmitter;

a receiver configured to receive the signal;

wherein the transmitter is further configured to change the weighting coefficients determined for each transmit antenna path with respect to one another and configured to weight the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another;

wherein the receiver is configured to perform measurements on the received signals that were transmitted via the different transmit antenna paths, and signal to the transmitter the weighting coefficient data formed based on the measurements;

wherein the transmitter is further configured to receive the weighting coefficient data signaling, and to form weighting coefficients using the weighting coefficient data signaling; and

wherein the transmit antenna paths are connected to at least two different base stations of a network part in the radio system.

79. (New) The radio system of claim 71, wherein the transmitter is further configured to signal the weighting coefficients used in the transmission to the receiver using pilot bits inserted in the transmitted signal.

80. (New) The radio system of claim 74, wherein the transmitter is further configured to signal to the receiver identification data for the group of weighting coefficients used in the transmission using pilot bits inserted in the transmitted signal.

81. (New) A radio system for transmitting a digital signal, comprising:

a transmitter configured to transmit a signal;

at least two transmit antenna paths that can be connected to the transmitter;

a receiver configured to receive the signal;

wherein the transmitter is further configured to change the weighting coefficients determined for each transmit antenna path with respect to one another, and configured to weight the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another,

wherein the receiver is further configured to perform measurements on the received signals that were transmitted via the different transmit antenna paths and configured to signal to the transmitter the weighting coefficient data formed based on the measurements;

wherein the transmitter is further configured to receive the weighting coefficient data signaling, to form weighting coefficients using the weighting coefficient data signaling; and to form a quality value for the weighting coefficient data signaling it has received, wherein the weighting coefficients are formed using the quality value of the weighting coefficient data signaling and the signaling itself; and

wherein, when the quality value for signaling falls below a predetermined threshold value, the changing means do not change the weighting coefficients.

82. (New) A radio system for transmitting a digital signal, comprising:

a transmitter is configured to transmit a signal;

at least two transmit antenna paths that can be connected to the transmitter;

a receiver configured to receive the signal;

wherein the transmitter is further configured to change the weighting coefficients determined for each transmit antenna path with respect to one another and configured to

weight the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another,

wherein the receiver is configured to perform measurements on the received signals that were transmitted via the different transmit antenna paths, and signal to the transmitter the weighting coefficient data formed based on the measurements;

wherein the transmitter is further configured to receive the weighting coefficient data signaling, to form weighting coefficients using the weighting coefficient data signaling, and to form a quality value for the weighting coefficient data signaling it has received, wherein the weighting coefficients are formed using the quality value of the weighting coefficient data signaling and the signaling itself; and

wherein, when the quality value for signaling falls below a predetermined threshold value, the weighting coefficients is set to an equal value over each transmit antenna path.

83. (New) A radio system for transmitting a digital signal, comprising:

a transmitter configured to transmit a signal;

at least two transmit antenna paths that can be connected to the transmitter;

a receiver configured to receive the signal;

wherein the transmitter is further configured to change the weighting coefficients determined for each transmit antenna path with respect to one another and to weight the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another,

wherein the receiver is further configured to perform measurements on the received signals that were transmitted via the different transmit antenna paths and configured to signal to the transmitter the weighting coefficient data formed based on the measurements;

wherein the transmitter is further configured to receive the weighting coefficient data signaling, to form weighting coefficients using the weighting coefficient data signaling, and to form a quality value for the weighting coefficient data signaling it has received, wherein the weighting coefficients are formed using the quality value of the weighting coefficient data signaling and the signaling itself; and

wherein, when the quality value for signaling exceeds a predetermined threshold value, the weighting coefficients are changed.

84. (New) The radio system of claim 71, wherein signals to be transmitted via two different transmit antenna paths are as mutually orthogonal as possible.

85. (New) The radio system of claim 71, wherein the transmitter is further configured to code the signal in order to minimize transmission errors in the transmission channel.

86. (New) The radio system of claim 85, wherein the coding is space-time coding.

87. (New) The radio system of claim 86, wherein the space-time coding is space-time block coding.

88. (New) The radio system of claim 86, wherein the space-time coding is space-time trellis coding.

89. (New) The radio system of claim 71, wherein the transmit antenna paths are connected to one base station of the network part of the radio system.

90. (New) The radio system of claim 71, wherein the transmitter is situated in a radio network subsystem of the radio system network part, and the receiver is situated in a user equipment of the radio system.

91. (New) The radio system of claim 71, wherein the user equipment of the radio system is configured to determine the weighting coefficients used by the network part of the radio system in transmitting to the user equipment in question.

92. (New) The radio system of claim 71, wherein the network part of the radio system is configured to determine the weighting coefficients it uses in transmission.

93. (New) The radio system of claim 91, wherein the user equipment utilizes data about the loading of a power amplifier of each transmit antenna path.

94. (New) The radio system of claim 71, wherein a transmit antenna path is implemented using an antenna structure that provides phasing.

95. (New) A transmitter for transmitting a digital signal in a radio system, the transmitter comprising:

changing means for changing the weighting coefficients determined for each of at least two transmit antenna paths with respect to one another, and

weighting means for weighting the transmit power of the signals to be transmitted to a receiver via different transmit antenna paths using weighting coefficients that can be changed with respect to one another; and

means for receiving weighting coefficient data signaling sent by the receiver, wherein the changing means form weighting coefficients using the weighting coefficient data signaling, and

means for forming a quality value for the weighting coefficient data signaling it has received, and wherein the changing means form weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself.

97. (New) The transmitter of claim 95, wherein the values of the weighting coefficients are predetermined, and the predetermined values of the weighting coefficients are divided into different groups, each of which has a particular weighting coefficient determined for each transmit antenna path, the weighting coefficient data signaling comprising information about which group of weighting coefficients the receiver wants to be used.

98. (New) The transmitter of claim 95, wherein the weighting coefficient data comprises information about the transmit antenna path via which the signal with the best quality value was transmitted.

99. (New) The radio system of claim 95, wherein the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially.

100. (New) The radio system of claim 95, wherein the weighting coefficient data comprises at least one channel parameter measured by the receiver.

101. (New) A receiver that receives a digital signal in a radio system, the receiver comprising:

means for receiving digital signals from a transmitter via one of at least two transmit antenna paths, the digital signals having been transmitted using transmission power that is weighted by the transmitter using weighting coefficients that can be changed with respect to one another;

means for performing measurements on the received signals that were transmitted via the different transmit antenna paths, and means for signaling to the transmitter weighting coefficient data formed based on the measurements; wherein

the signaled weighting coefficient data enables the transmitter to form a quality value for the weighting coefficient data signaling it has received, and wherein the transmitter forms weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself.